

## REMARKS

Favorable reconsideration of this application is respectfully requested.

Claims 16 and 17 were objected to on the basis that the claims depend from canceled Claim 6. The dependency of these claims has been changed by this Amendment, and withdrawal of the objection is respectfully requested.

Claims 1-3, 5, and 7-20 have been rejected under 35 USC §103(a) as being obvious in view of excerpts taken from Volume 2 of the ASM Handbook ("ASM Handbook"). The claims have also been rejected under 35 USC §103(a) as being obvious over a combination of the teachings of JA 53-16312 and the ASM Handbook. These rejections are respectfully traversed.

The basic premise of the two grounds of rejection is that the ASM Handbook, specifically the disclosure of Alloy 356.0 and 357.0, and JA53-16312, each discloses an alloy composition which overlaps (or touches a boundary of) the composition as recited in Claims 1, 4, 5 and 15. It is further asserted that the solution heat treatment and aging times and temperatures set forth in the ASM Handbook and in JA53-16312 are essentially the same as those set forth in certain dependent claims in the present application.

The grounds for rejection specifically acknowledge that, "the prior art does not teach the solidification rate of the casting or what phases are present as a result of the above mentioned process steps". However, it is asserted that it is "well known to one of ordinary skill in the art to solidify castings at rapid rates in order to produce a high quality casting with small DAS [dendrite arm spacing]". Page 133 of the ASM Handbook is cited as evidencing this knowledge attributed to those of ordinary skill in the art.

Even though the prior art admittedly does not teach which phases are present in the final (and intermediate) alloys disclosed, it was concluded that, because the prior art discloses substantially the same alloy processed in substantially the same steps (referring to a solution treatment at 540° C. for 2 or more hours, as disclosed in the present specification with respect to an alloy containing Mg), then substantially the same product would result. This is asserted to establish a prima facie case of obviousness, in the absence of evidence to the contrary.

On this latter issue, Applicant believes that evidence to the contrary exists in the very references relied upon in rejecting the claims. The references collectively demonstrate that persons of ordinary skill in the art do not employ broad, sweeping general conclusions regarding what processing steps are considered “substantially the same”. In the two grounds of rejection, the Examiner asserts that both the solution heat treatment for the 356.0 alloy (@535-540° C.) and for the alloy in JA53-16312 (545-555° C.) are “substantially the same” as that used for the alloy of the present invention. However, the JA53-16312 reference itself clearly evidences that the solution heat treatment employed therein is not regarded as being substantially the same as the conventional A356.0 solution heat treatment. The English language abstract of JA53-16312, and portions of the specification which can be understood, evidence that the solution heat treatment set forth therein (545-555° C.) was considered to be inventively different from the “usual” solution treatment (see Col. 2, line 1, of JA53-16312) used for A356 alloys.

The most recent Official Action fails to address this point, and continues to assert, without underlying support and contrary to the JA53-16312 reference itself, that the various disclosed solution heat treatments are “substantially the same”. The

rejection improperly carries this even one step further, in asserting that the claimed solution heat treatment is substantially the same as those disclosed in the references.

The evidence of the level of skill in the art and the understanding of those of ordinary (or possibly extraordinary) skill in the art, however, directly refutes the conclusion that the various cited references and the specification in the present invention disclose “substantially the same” solution heat treatment process steps. Thus, the attempt to shoehorn an anticipation/inherency rationale into an obviousness rejection is not proper. That, combined with the admission that the cited prior art does not disclose what phases are present in the alloy, can lead only to the conclusion that it would not have been obvious to persons of ordinary skill in the art to produce the claimed alloy, in which the sole or predominant iron-containing phase is  $\beta$  phase that has formed as a transformation product of the  $\pi$  phase. There is no evidence of record indicating that persons of ordinary skill were taking this into account. Rather, as evidenced in the present specification, both the  $\pi$  and  $\beta$  phases were seen as being detrimental to mechanical properties (p. 3, lines 12-13), and, when those deleterious effects were to be reduced or eliminated, those skilled in the art took measures to eliminate the  $\pi$ -phase (rather than transform it to  $\beta$  phase), by the addition of beryllium, for example. The rejection of Claims 1 and 5, and all claims depending therefrom, is therefore improper and should be withdrawn.

In a similar vein, the grounds for rejection improperly attempt to graft some very general teachings relating to aluminum foundry alloys, to the disclosures of specific types of alloys, in reaching the conclusion that the invention set forth in Claims 1 and 5, and all dependent claims, would have been obvious to a person of ordinary skill in the art.

Applicant incorporates herein by reference the comments and observations presented in the Preliminary Amendment (pages 7-9) filed August 24, 1999, regarding the inconsistencies between the generalized statements contained in the ASM Handbook and the findings in the present invention. Those inconsistencies evidence that the statements in the ASM Handbook are not to be interpreted, and are not so interpreted, by persons of ordinary skill in the art as being applicable to any alloy that might be developed.

In further support of these contentions, Applicant submits herewith a Declaration executed by Dr. Malcolm Couper, one of the named co-inventors in this application. Dr. Couper establishes in this Declaration that he is a person of at least ordinary skill in the art, and is therefore qualified to make the statements in the declaration directed to how persons skilled in the art will interpret or regard the ASM Handbook as a reference source.

The Declaration (§5) points to several examples as to why persons skilled in the art would not blindly adhere to the generalized statements made in the ASM Handbook, regardless of the particular aluminum alloy under consideration or under development.

The Declaration further evidences (§§7-9) that the findings in the development of the present invention indeed do not correlate to the general statements relied upon in making the rejection. As such, the only reasonable conclusion that can be reached is that the ASM Handbook may provide some useful preliminary information, but would not be looked to by a person of ordinary skill the art as a source of information that is reliable regardless of the particular compositions in question.

The compositions in the cited references are at the very margins of the compositions set forth in the present invention, barely touching on the claimed ranges

in most instances. As such, it is not reasonable to assume, as does the Official Action, that the phases present in the microstructure of the reference compositions are the same as in the claimed invention. Paragraphs 10-13 of the Declaration address this point. Paragraph 11 specifically refutes the conclusion reached by the Official Action that the microstructure or phases present in alloys produced in accordance with the cited references will be the same as those claimed in the present application. That paragraph notes that the ability to produce an alloy having  $\beta$  phase rather than the  $\pi$  phase, at this level of Mg and fine dendrite cell size, is not generally known in the art.

Therefore, to the extent that the ASM Handbook or the combination of the ASM Handbook with JA53-16312, is seen as establishing a prima facie case of obviousness, the facts and observations set forth in the Declaration clearly rebut and overcome that prima facie case.

In view of the foregoing, Applicant respectfully submits that the rejections of Claims 1-3, 5 and 7-20 under 35 USC §103(a) are not well founded and should be withdrawn.


All claims are now presented are believed to be allowable and are, in all other respects, in condition for allowance. Reconsideration and withdrawal of all rejections, and passage of the application to issue, are earnestly solicited.

No fee is believed to be due in connection with the filing of this Amendment. However, if it is determined that a fee for a Petition for Extension of Time, or any

other fee, is due, authorization is hereby given to charge such fee to Deposit Account  
501165.

Respectfully,

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**Version With Markings to Show Changes Made**

1           16. (Amended) The method defined in claim [6] 5, wherein the sole or  
2           predominant iron-containing phase in the alloy article is  $\beta$  phase.

1           17. (Amended) The method defined in claim [6] 5, wherein the step of  
2           solidifying the casting produces iron-containing phases that include a substantial  
3           proportion of  $\pi$  phase and the subsequent solution heat treatment step is effective to  
4           convert a majority of the  $\pi$  phase to  $\beta$  phase to give a microstructure in the alloy  
5           article that includes iron-containing phases which are predominantly  $\beta$  phase.